UCL

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# Depressed, anxious? Blame your pea brain

#### **Oliver Moody**

Feelings of dread and depression have been linked to an ancient part of the brain half the size of a pea that "teaches" us how to deal with threats.

The habenula, a structure so old that humans share it with zebra fish, also appears to damage people's motivation and to slow their reactions when it is hyperactive. Neuroscientists led by a team from <u>University College London</u> have found that it plays a key role in how we learn to respond to things that might hurt us, and that it may influence levels of pessimism.

They suggested that ketamine, a drug used by nightclubbers and horse vets, could be used to dampen the habenula's activity and soothe the symptoms of depression within hours. Writing in *Proceedings of the* 

Writing in *Proceedings of the National Academy of Sciences*, they describe an experiment in which 23 people under an fMRI scanner gradually came to associate certain abstract pictures with electric shocks.

As the tests progressed, the volunteers' habenulae began to light up when they saw the pictures, even when they did not receive a shock. Rebecca Lawson, a research assistant at UCL's Institute of Cognitive Neuroscience, said that the images linked to pain had also slowed their reaction times.

Several earlier studies in animals have found that the habenula muffles dopamine, a neurotransmitter known as the body's "pleasure" chemical and thought to be intimately connected with levels of motivation.

"The slower people responded, the more reliably their habenula tracked associations with shocks," Ms Lawson said. "This demonstrates a crucial link between the habenula and motivated behaviour, which may be the result of dopamine suppression."

Jonathan Roiser, also from UCL, said that this link might explain how dreading individual events could be linked to depression.

He added that ketamine, increasingly mooted as a rapid treatment for depression, had been shown to calm the habenula in animals and could be equally effective in humans.

"The indications are that it works within a period of hours as opposed to a period of weeks," he said.





The Daily Telegraph {Main} Source: Edition: Country: UK Date: Tuesday 29, July 2014 Page: 7 Area: 18 sq. cm Circulation: ABC 514592 Daily page rate £46,000.00, scc rate £214.00 Ad data: 020 7931 2000 Phone: Keyword: University College London



## Alarm bell Brain's warning system

Scientists have identified the part of the brain that warns a person that something nasty could happen.

The habenula, half as big as a pea, allows people to learn from mistakes, and could be a key to new treatments for depression. Researchers at <u>University</u> <u>College London</u> showed that it tracks predictions about events like painful electric shocks.





The Independent {Main} Source: Edition: Country: UK Date: Tuesday 29, July 2014 Page: 18 86 sq. cm Area: Circulation: ABC 63505 Daily page rate £10,472.00, scc rate £44.00 Ad data: Phone: 020 7005 2000 University College London Keyword:



### Pessimistic tendencies linked to part of brain

#### KUNAL DUTTA

A tiny part of the brain could contribute to a pessimistic outlook and teach people to expect the worst – a phenomenon known as catastrophising – scientists believe.

An over-active habenula, scientists say, may be linked to depression, pessimism and a negative outlook.

"The habenula tracks our experiences, responding more the worse something is expected to be," Dr Jonathan Roiser, from <u>University College London's Institute of</u> Cognitive Neuroscience said. "The habenula doesn't just express whether something leads to negative events or not; it signals quite how much bad outcomes are expected."

The UCL team scanned the

brains of 23 healthy women who were shown a random set of pictures, some of which signalled a painful electric shock delivered to the left hand.

The functional magnetic resonance imaging (fMRI) scans showed that shock-associated pictures activated the habenula. The response was much stronger when an electric shock was almost certain than when it was unlikely.

Dr Roiser said the findings, published in the latest edition of the journal *Proceedings Of The National Academy Of Sciences*, may point the way towards new treatments.

He added: "Other work shows that ketamine, which has profound benefits in patients who failed to respond to antidepressant medication, specifically dampens down habenula activity."





Daily Mail {Main} Source: Edition: Country: UK Date: Tuesday 29, July 2014 Page: 5 78 sq. cm Area: ABC 1673579 Daily Circulation: Ad data: page rate £32,508.00, scc rate £129.00 Phone: 020 7938 6000 University College London Keyword:



# Found, the bit of brain that fuels pessimism

IF YOU think your glass is always half empty, it could be because of a tiny region of the brain that teaches us to expect the worst.

Scientists say the habenula, a part of the brain half the size of a pea, plays an important role in learning from bad experiences. In those with an over-active habenula, it may be linked to depression and pessimism, a study concluded.

'The habenula tracks our experiences, responding more the worse something is expected to be,' said Dr Jonathan Roiser, of <u>University</u> <u>College</u> <u>London</u>'s Institute of Cognitive Neuroscience.

'In this study we showed that the habenula doesn't just express whether something leads to negative events or not; it signals quite how much bad outcomes are expected.'

Random pictures were shown to 23 women, who were occasionally given a shock to the hand. The study, published in the journal Proceedings Of The National Academy Of Sciences, found the habenula reacted strongly when the women thought a shock might be imminent.









Metro (London) {Main} Source: Edition: Country: UK Date: Tuesday 29, July 2014 Page: 17 28 sq. cm ABC 761362 Daily Area: Circulation: Ad data: page rate £26,322.00, scc rate £121.00 020 7938 6000 Phone: Keyword: University College London





**DANGER SIGNS:** How bad can it be? Check with your habenula. The tiny part of the brain warns us of dangers such as electric shocks. It 'responds more the worse things are expected to be', said <u>University College</u> <u>London</u> researchers who gave brain scans to 23 volunteers.









Press & Journal (Aberdeen) {Main} Source: Edition: Country: UK Date: Tuesday 29, July 2014 Page: 24 Area: 109 sq. cm Circulation: ABC 63796 Daily page rate £11,770.00, scc rate £26.75 Ad data: Phone: 01224 690 222 University College London Keyword:



# Pessimism linked to overactive part of brain

#### HEALTH

If your glass is always half empty, it could be because of a tiny brain region that teaches us to expect the worst.

Scientists believe the habenula, an evolutionarily ancient part of the brain half the size of a pea, plays an important role in learning from bad experiences.

In some people, an over-

active habenula may be linked to depression, pessimism and a negative outlook.

"The habenula tracks our experiences, responding more the worse something is expected to be," said lead researcher Dr Jonathan Roiser, from <u>University</u> <u>College London</u>'s Institute of Cognitive Neuroscience.

"In this study we showed that the habenula doesn't

just express whether something leads to negative events or not; it signals quite how much bad outcomes are expected."

The UCL team scanned the brains of 23 healthy women who were shown a random set of pictures, some of which signalled a painful electric shock delivered to the left hand.

The functional magnetic resonance imaging scans

showed that shock-associated pictures activated the habenula. The response was stronger when a shock was almost certain than when it was unlikely.

Dr Roiser said the findings, published in the latest edition of the journal Proceedings Of The National Academy Of Sciences, may point the way towards new treatments.

He added: "Other work

shows that ketamine, which has profound and immediate benefits in patients who failed to respond to standard antidepressant medication, specifically dampens down habenula activity.

"Therefore, understanding the habenula could help us to develop better treatments for treatmentresistant depression."

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# Glass half empty? Then you can blame a tiny part of your brain

IF YOUR glass is always half empty, it could be down to medical reasons.

Experts believe that a tiny region of the brain teaches people to expect the worst.

Scientists say that the habenula, an evolutionarily ancient part of the brain half the size of a pea, plays an important

role in learning from bad experiences.

In some people, an overactive habenula may be linked to depression, pessimism and a negative outlook.

"The habenula tracks our experiences, responding more the worse something is expected to be," said lead researcher Dr

Jonathan Roiser, from <u>University</u> <u>College London's Institute of</u> <u>Cognitive Neuroscience.</u>

"In this study we showed that the habenula doesn't just express whether something leads to negative events or not.

"It signals quite how much bad outcomes are expected."

The UCL team scanned the

brains of 23 healthy women who were shown a random set of pictures, some of which signalled a painful electric shock delivered to the left hand.

The functional magnetic resonance imaging (fMRI) scans showed that shock-associated pictures activated the habenula.

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Dr Roiser said the findings, published in the latest edition of the journal *Proceedings Of The National Academy Of Sciences*, may point to new treatments. He added: "Other work

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has profound and immediate benefits in patients who failed to respond to standard antidepressant medication, specifically dampens down habenula activity. "Therefore, understanding the habenula could help us to develop better treatments for treatment-resistant depression."

